Mitigating Information Asymmetries through Collateral Pledges

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Abstract

This study determines if small business collateral requirements differ between racial/ethnic and gender groups and how firm, loan, and market characteristics impact any differences in these terms. Previous literature establishes that Hispanics, Blacks, and females are considered riskier than their non-minority and male counterparts, receiving more loan denials and higher loan costs. Lenders mitigate asymmetric information by monitoring or influencing riskier borrowers through the use of non-price loan factors such as collateral requirements. Data from the Federal Reserve's Survey of Small Business Finances is analyzed to determine whether lenders impose larger collateral requirements on minority and female small businesses as a way to monitor this group of borrowers. A Blinder-Oaxaca decomposition is used to demonstrate how variations in collateral requirements are influenced by identifying characteristics. Decomposition results show differences collateral requirements and much of the evidenced gap is attributed to differences in levels of banking competition in borrower markets, loan interest rates, and loan amounts.

Keywords: collateral, small business, minorities, women, discrimination

1. Introduction

The subprime mortgage crisis and the real estate bubble have prompted widespread credit rationing by lenders. Forced to write off toxic assets and maintain higher capital requirements, lenders have begun to impose tighter lending standards on their borrowers. In an economic downturn, more stringent loan terms such as higher collateral requirements, tend to be the norm (Henderson and Akers, 2009; Jimenez, Salas and Saurina, 2006). It is important to continue to study the impact of this non-price loan term, particularly as it relates to small businesses, due to the ever increasing nature of stringent credit markets.

Small businesses are highly susceptible to changes in collateral loan terms. In a 2003 study, the Small Business Administration notes that about 65% of a small firm's financing comes from banks and similar financial institutions. These lenders may be somewhat hesitant to extend credit to small businesses which tend to be more informationally opaque and lack detailed financial statements (Berger and Udell, 1998). Collateral requirements give lenders that additional sense of security needed to provide loans with favorable terms. In fact, Berger and Udell (1998) find that about 90% of small business loans are secured by collateral. Similarly, Leeth and Scott (1989) find that a majority of small business loans are secured by collateral.

Collateral use may play different roles under different circumstances, as evidenced by research where it can be used as a method to mitigate information asymmetries or as a signal of creditworthiness by the borrower. Akerlof (1970), Coco (2000), Booth and Booth (2006) and Berger and Udell (1995) find that collateral can be imposed by the lender to minimize the repercussions of information disparities between the lender and the borrower. Leeth and Scott (1989),Chan and Kanatas (1985), and Spence (1973), however, depict scenarios where borrowers may attempt to self-impose collateral as a signal of their creditworthiness and to obtain more favorable loan terms.
The aforementioned studies have looked at links between lender, borrower, and market characteristics and the use of collateral in loan contracts, but few have looked at how gender and ethnicity/race might affect these requirements.

Haynes (1995) finds that women owned businesses pay a higher interest rate on their loans, typically get smaller loans, and also face more collateral requirements than their male counterparts. Dymski (2005) mentions how necessary it is to continue studying whether or not discrimination against minorities exists in the housing and credit markets because prior research has not reached a conclusive decision on the matter.

The purpose of this study is to find if minorities or women experience different collateral requirements than their white and male counterparts. Once those differences are assessed, it is important to understand what underlying factors contribute to that discrepancy.I look at some of the firm characteristics that Jimenez et al (2006), Booth and Booth (2006), and Hulburt and Scherr (2003) use, such as firm age and the financial health of the firm in order to assess whether or not differences exist due to gender or ethnicity. I also include characteristics on the lender-borrower relationship length, the geographic proximity of the borrower to the lender, and the level of banking competition in the borrowers market as these have been found to impact collateral requirements as well as other loan terms (Berger and Udell, 1998; Boot and Thakor, 1994; Degryse and Ongena, 2002). Other loan contractual terms used include the interest rate and dollar amount of the loan in question.

A regression analysis and subsequent decomposition is used to understand how the aforementioned factors may help explain any differences in the collateral requirements between ethnic and gender groups. The results show that there is in fact a gap between the collateral requirements imposed on White and male owned businesses when compared to Hispanic, Black, and female owned businesses. The difference, however, is not one where the "riskier" groups are more often asked to guarantee their loans with collateral. White and male owned businesses pledge collateral on their loans more often than Hispanic, Black, and female owned businesses. The decomposition shows that the gap in collateral requirements between White owned businesses and Hispanic and Black owned businesses is explained by the loan interest rates, the level of banking competition in the borrower's market, and to a lesser degree by the amount of the loan. The difference in collateral requirements between male and female owned businesses is explained more so by the loan interest rates and loan amounts.

2. Literature Review

Just as Akerlof (1970) first wrote about the proactive approach of mitigating information asymmetries through the use of guarantees, other researchers have also found that in the realm of banking, lenders find it particularly useful to use collateral as a way to combat the moral hazard problems that information asymmetries can create. Coco (2000), Booth and Booth (2006), and Berger and Udell (1995) find that collateral can be used by lenders as a screening device, and in the case of the two latter studies, that collateral requirements increase with the level of default risk presented by the borrower.

Coco (2000) looks at many other collateral studies and finds that asymmetric information in proposed firm projects as well as between the lender and borrower contributes to the use of this non-price loan term. He finds that collateral is used more by individuals with insufficient established credit histories and acknowledges that not enough has been researched into the impact that long term relationships between lender and borrower might have on collateral requirements. Booth and Booth (2006) note that most collateral studies focus on the use of collateral for mitigating adverse selection and moral hazard exposures. They analyze a sample of commercial bank loans provided by the Securities and Exchange Commission and the Loan Pricing Corporation, and find that as default risk increases, so does the collateral requirement.

The authors find that loan maturity, firm sales, firms size, presence of commitment fees, loan intentions, and the use of bank prime rates all play a role in determining whether a loan is secured or not. Berger and Udell (1995) realize that small and large firms are financed differently, especially considering that smaller firms are deemed riskier by lenders. Since asymmetric information problems are more prevalent in small businesses, lenders often turn to devices such as the use of collateral or guarantees to minimize their risk exposure. By analyzing interest rates and collateral requirements on small business lines of credit, the authors find that collateral is required more often by lenders as the borrower's risk level increases. Jimenez, Salas, and Saurina (2006) posit that collateral use is affected by borrower, lender, credit market, loan, relationship, and economic characteristics. The authors find that low credit quality borrowers (assessed through prior defaults) are more likely to have collateralized/secured loans than better quality borrowers. Another peripheral study that looks at what factors affect collateral requirements include Hulburt and Scherr (2003) who find that firm size, measured by the log of sales in dollars, and firm age, as a proxy for the reputation a firm generates over time (which decreases the information asymmetry associated with the firm), affect collateral requirements.

Many of the aforementioned studies have looked at collateral as a contractual feature imposed by the lender onto the borrower, however, there are other studies which look at how borrowers themselves can use this non-price loan term as a signal to obtain more favorable loan terms.

Spence (1973) first proposed the notion of signaling as a way to overcome information asymmetries in the job market. The idea behind this theory is that the agent (in this case, the employee) will try to indicate a redeeming quality about themselves to the principal (in this case, the employer) in order to obtain more favor by the principal. The agents might attempt to showcase their educational background as a means to convey their aptitudes or job skills. Translating this to loan markets, one knows that in some instances, borrowers attempt to convey their creditworthiness to lenders in order to obtain more favorable loan terms.

Leeth and Scott (1989) analyze data from over one thousand small business loans and find that collateral can be used to minimize borrowing costs. By providing collateral, lenders can relax their monitoring of the borrowing firms, thereby decreasing their monitoring costs. These savings can then be passed onto the borrower. Creditworthy borrowers can use collateral to signal their low risk to a lender, perhaps even allowing them to secure lower interest rates on their business loans. Chan and Kanatas (1985) also find that collateral can be used as a variable that can subsequently impact loan terms. By using collateral as a signal, borrowers can convey information not readily available to lenders about the level of risk associated with their firms.

The previously mentioned studies depict two possible scenarios. The first embodies borrowers that are deemed high risk by lenders. Due to the risk inherent in their business loans, lenders require additional guarantees to secure their funds. As such, lenders impose more collateral requirements on riskier borrowers to help mitigate any issues that may arise from moral hazard. The second scenario is one in which borrowers that are in fact low risk may wish to signal this quality to the lending institution. They are willing to provide collateral on their business loans to convey the viability of their proposed operations or projects. By providing backing for their loans, they know that the lender will be able to decrease their monitoring costs of the firm and may pass those savings onto the borrowers in the form of lower interest rates. Providing collateral becomes a way in which borrowers can decrease their overall borrowing costs.

The data provided by the Survey of Small Business Finances does not allow us to differentiate between a situation where collateral requirements were imposed by the lender or one where collateral was willingly provided by the borrower. However, the purpose of this study is simply to find if differences exist in collateral requirements between groups and how certain firm, market, and loan characteristics might impact any gap that exists in their collateral requirements.

The first variable associated with collateral requirements has to do with the relationship that exists between the lender and the borrower; it is important to understand how relationships between the lender and the borrower affect collateral requirements imposed on borrowers. Voordeckers and Steijvers (2006) find that firm characteristics and the relationship between borrower and lender were more important in determining collateral requirements than loan or lender characteristics. Berger and Udell (1995) find that lenders that have maintained a longer relationship with their borrowers typically encounter lower interest rates and are less likely to be asked to pledge collateral. This notion is also found by Chakraborty and Hu (2006). They find that the requirement of collateral decreases with the longevity of the relationship between lender and borrower. To proxy for this relationship, the authors look at the number of years the borrower has had business with the financial institution. They also look at the number of financial services the business uses at the bank. Financial services include checking and savings accounts, as well as transaction, cash management, pension, brokerage, and credit services. This information is readily available through the Survey of Small Business Finances.

Along with borrower lender relationships, I look at the geographic proximity of the lender to the borrower and the banking market concentration where the borrower is located. Degryse and Ongena (2002) find that the smaller the distance between the borrowing firm and the lending bank the lower loan interest rates tend to be. De Young,Glennon, and Nigro (2008) find that the greater the distance between the lender and borrower, the greater the informational asymmetries. Lenders that are geographically distant from their borrowers endure costlier monitoring and are also less familiar with the market in which the borrowing firm operates. These studies show that distance may foster less favorable loan terms. Berkovec, et al (1998) and Cavalluzzo, Cavalluzzo, and Wolken (2002) both find that discrimination occurs more in less competitive markets.

Increased competition between lenders creates fewer differences in loan availability between minorities and their non-minority counterparts.

The impact that firm age has on collateral requirements is also assessed in this study. Boot and Thakor (1994) find that newer firms tend to pay higher rates of interest on their business loans and are required to provide collateral on their loans more often. Hulburt and Scherr (2003) also find that as firm age increases, the likelihood of receiving collateral requirements diminishes. They posit that this stems from the fact that older firms enjoy more established reputations. Credit scoring is another influential factor for determining loan terms. Berger, Frame, and Miller (2005) find that credit scoring helps to better identify low risk small business borrowers and this in turn allows them to obtain larger loan amounts and lower collateral requirements. Berger and Udell (1998) also find that riskier firms are often required to use more collateral. Small business credit scoring is an instrument that lenders are implementing more often to overcome the informational opacity that often accompanies small businesses. Finally, the study of collateral requirements requires the inclusion of interest rates and loan amounts as these may influence or may be influenced by collateral requests (Jimenez, Salas, and Saurina, 2006; Boot, Thakor, and Udell, 1991; Leeth and Scott, 1989).

One final characteristic that tends to be included in some studies has to do with the economic conditions during the time the loans are created. As is evidenced in today's credit crunch climate, the state of the economy may impact the severity of lender pre-qualifications on its borrowers. However, because the nature of the data I use is such that only loans occurring during the past three years are used, this variable can be omitted as all loans occur around the same time and under similar economic conditions.

3. Data and Variable Definitions

To assess differences in collateral requirements between minorities and women and men, I use the 2003 Federal Reserve's Survey of Small Business Finances (SSBF). This survey provides information on small businesses with fewer than 500 employees. The total sample size includes 4,240 small businesses that are "non-governmental, non-financial, non-agricultural for profit" firms, and there are a total of 5 implicates to create 21,200 observations.

The dependent variable in this analysis relates to the incidence of collateral requirements experienced by the small business borrower. The SSBF asks those small business owners who have acquired a loan within the past 3 years whether or not collateral was required to secure their most recent loan. If the business owner answered "yes," the variable was assigned a value of one. A value of zero was assigned for those borrowers who did not secure their most recent loan with collateral.

The explanatory variables I include are divided into firm specific characteristics, market characteristics, and loan specific characteristics.I use the aforementioned data and methodology to assess differences in collateral requirements between White and Hispanic business owners, White and Black business owners, and male and female business owners.

Firm specific characteristics include the relationship length borrowers have with their lenders, the geographic proximity the borrower has to its lending bank, the firm's age in years, and the firm's Dunn and Bradstreet credit score. To control for relationships between the borrower and the lender, relationships are represented by the number of months the borrower has maintained a relationship with the lender. Geographic proximity between the lender and the borrower is provided as the number of miles between them. The age of the firm in years is indicative of the established reputation of the firm. The more established the firm is, the less risky lenders view it and the more likely it can achieve more favorable loan terms. The Dunn and Bradstreet credit score provides insight into the financial health of the firm. It assesses the likelihood of default for business borrowers and is widely used by lenders in determining whether to qualify business borrowers for loans. The score ranges from one to six, with six representing the least risky firms.

The market characteristic refers to the level of bank market concentrations. Bank market concentration in the firm's local area is assessed by a Herfindahl score from one to three. This number is correlated to the market share of banks and similar financial institutions within the small business' area. The higher the score, the greater the level of bank competition in the business owner's region. The loan terms I consider include the dollar amount of the loan, divided by one million, and the interest rate on the loan, depicted as a whole number percentage.

4. Methodology

I use a Blinder-Oaxaca decomposition technique due to the fact that my dependent variable in the study is a dummy variable. The use of this model provides insight into group differences that might affect collateral requirements after adjusting for other factors.

To begin the comparison, the following groups are defined: White business owners (w), Hispanic business owners (h), Black business owners (b), Male business owners (m) and Female business owners (f). The definitions for minority or female owned businesses are taken from the Small Business Administration. A firm is considered minority owned or female owned when at least 51% of the firm is owned by a minority or a female. The dependent variable in question for all groups is whether or not collateral is required on their business loans. A 1 represents the existence of collateral on the loan, a 0 represents the non-existence of collateral on the loan.

The first step in the analysis involves the use of regression analysis to estimate the coefficients of the dependent variables. Each group is assigned their own particular regression, allowing for separate and different coefficient estimates per group. The estimates and means are used to conduct the decomposition.

A two-fold decomposition (Jann, 2008) to determine how much of the gap between Hispanic and White owned business collateral requirements can be explained by the independent variables is used. White owned businesses are denoted by the subscript (w), while Hispanic owned businesses are denoted by the subscript (h). Coll represents the dependent binary variable and takes on a value of one if the borrower was required to secure their loan with collateral, and zero if they were not.

The decomposition is done as follows:

$Coll_w = a_w + b_wFirm_w + c_wMarket_w + d_wLoan_w + e_wIdent_w$

$Coll_h = a_h + b_hFirm_h + c_hMarket_h + d_hLoan_h + e_hIdent_h$

Firm represents a vector of firm characteristics such as the lender-borrower relationship length denoted in months, the distance between the lender and borrower in miles, the age of the firm in years, and a credit score that ranges from one to six (with one being the riskiest and six being the least risky). Market refers to the Herfindahl score which represents the level of bank and financial institution competition in the borrower's market. Loan represents a vector of other loan terms such as the loan amount (divided by one million) and the loan interest rate. Ident refers to the identifying characteristic of gender or race for each group. The independent variable coefficients, b, c, d, and e, are estimated using regression analysis for White (w) and Hispanic (h) owned businesses.

The following represents the difference in collateral requirements across groups

$Coll_w - Coll_h = a_w + b_wFirm_w + c_wMarket_w + d_wLoan_w + e_wIdent_w –$
$(a_h + b_hFirm_h + c_hMarket_h + d_hLoan_h + e_hIdent_h),$
and can be rewritten as:
$Coll_w - Coll_h = b_w(Firm_w – Firm_h) + c_w(Market_w - Market_h) + d_w(Loan_w - Loan_h) + e_w(Ident_w – Ident_h) + (a_w - a_h) + (b_w- b_h)Firm_h + (c_w- c_h) Market_h + (d_w- d_h) Loan_h +$
$(e_w- e_h)Ident_h$

$Coll_w - Coll_h$ represents the difference in collateral requirements between groups, $b_w(Firm_w – Firm_h) + c_w(Market_w - Market_h) + d_w(Loan_w - Loan_h) + e_w(Ident_w – Ident_h)$ represents the part of the gap in collateral requirements between groups that can be explained by differences in the endowments of the White and Hispanic owned businesses, and $(a_w - a_h) + (b_w- b_h)Firm_h + (c_w- c_h) Market_h + (d_w- d_h) Loan_h + (e_w- e_h)Ident_h$represents the part of the difference in loan collateral requirements between groups that cannot be explained. This unexplained component may be indicative of discrimination (Jann 2008), but can also exist if variables which can contribute to the dependent variable differential are omitted.

Dividing the explained factor by the mean difference in collateral requirements tells us what percentage of the difference in collateral requirements is explained by differences in the firm, market, loan, and identifying characteristics of the businesses. By dividing the unexplained factor with the mean difference in collateral requirements, the result is the percentage of the difference in collateral requirements that remains unexplained (Shannon, n.d.).

The same model is calculated for finding differences between White owned businesses (w) and Black owned businesses (b)

$Coll_w - Coll_b = b_w(Firm_w - Firm_b) + c_w(Market_w - Market_b) + d_w(Loan_w - Loan_b) + e_w(Ident_w - Ident_b) + (a_w - a_b) + (b_w - b_b)Firm_b + (c_w - c_b)\ Market_b + (d_w - d_b)\ Loan_b + (e_w - e_b)Ident_b$

and Male owned businesses (m) and Female owned businesses (f)

$Coll_m - Coll_f = b_m(Firm_m - Firm_f) + c_m\ (Market_m - Market_f) + d_m(Loan_m - Loan_f) + e_m(Ident_m - Ident_f) + (a_m - a_f) + (b_m - b_f)Firm_f + (c_m - c_f)\ Market_f + (d_m - d_f)\ Loan_f + (e_m - e_f)Ident_f$

5. Results

The descriptive statistics on collateral requirements in Table 1 do not imply that White and male owned businesses are asked to provide collateral backing for their loans less often than their minority or female owned business counterparts. In fact, Whiteowned businesses are asked to provide collateral 50.7% of the time, compared to the 42.9% of the time that Hispanic owned businesses are asked to provide collateral and the 21.1% of the time that Black owned businesses are asked to provide collateral. Male owned businesses are required to put up collateral on their loans 51.4% of the time, relative to female owned businesses which are only required to provide collateral 41.6% of the time. These findings of collateral frequency hold up when analyzing loans of varying amounts. For all loans under the $100 thousand range, White owned businesses are required to put up collateral 41.1% of the time.

Hispanic and Black owned businesses only have to put up collateral 37.2% and 16.9% of the time, respectively. The same holds true for male and female owned businesses in this loan range. Female owned businesses are only asked to provide collateral 33.3% of the time, whereas male owned businesses are asked to provide collateral 41.9% of the time. For all loans under $50 thousand dollars, the results do not change. In this instance, White owned businesses are asked to provide collateral 39.7% of the time whereas Hispanic and Black owned businesses are asked to back up their loans with collateral 18.6% and 16.4% of the time. While the results do not coincide with less favorable loan terms for riskier borrowers, one has to incorporate the size of the loans in question. Generally speaking, the descriptive statistics show that White and male owned businesses are able to obtain much larger business loans, which may require them to back up their loans with more collateral.

The other independent variables tell a story of white owned businesses having lengthier relationships with their lenders and being more established and less risky. White owned businesses have a relationship length with their lenders of about 99.4 months. Hispanic and Black owned businesses have relationships of about 88.5 and 31.2 months with their lenders. Male owned businesses have substantially lengthier relationships with their lenders than female owned businesses, averaging 100.5 months relative to 82.2 months. White and male owned businesses are also more established than minority and female owned businesses, with average firm ages of 15.8 and 16.0 years, respectively. Hispanic owned businesses average 11.8 years of age, Black owned businesses average 9.8 years of age, and female owned businesses average 12.7 years of age. White owned businesses are considerably safer than Black owned businesses, with a Dunn and Bradstreet credit score of 3.74, compared to the 2.48 credit score seen in Black owned businesses.

Loan amounts and interest rates also considerably differ between all groups. White owned businesses have loan amounts that average $320 thousand, whereas Hispanic owned businesses average $100 loans and Black owned businesses average $90 thousand loans. Male owned businesses average loans of about $340 thousand and female owned businesses average about $150 thousand loans. The interest rates White owned businesses obtain on their loans are much lower than the Hispanic and Black owned business interest rates, at 6.37% compared to 8.80% and 9.95%, respectively. Male owned businesses also tend to qualify for lower interest rate loans, averaging 6.43% on their loans compared to female owned businesses that average 7.07%.

The decomposition results in Table 2a and b show that a gap clearly exists in the incidence of collateral requirements between White owned businesses and Hispanic and Black owned businesses. In the case of White and Hispanic owned businesses, 50% of White owned businesses are asked to secure their loans with collateral, compared to 43% of Hispanic owned businesses that are asked to do the same. Eighty four percent of this gap in collateral requirements is mainly due to the interest rateimposed on the loans.

While this contradicts the notion set forth by some researchers (Booth and Booth, 2006; Berger and Udell, 1995; Jimenez, Salas, and Saurina, 2006) that riskier borrowers would be required to put up more collateral on their loans, it falls in line with the self selection studies done by Leeth and Scott (1989) and Chan and Kanatas (1985). According to the authors, less risky borrowers are willing to show their low default probabilities (much like the signaling concept depicted by Spence in 1973) by accepting loans with higher collateral requirements in exchange for lower interest rates.

In this case, the White owned businesses are deemed less risky as they have longer periods of existence and have better credit scores than the Hispanic owned businesses. Their longer relationship length also makes the possibility of negotiating the terms of the contract higher for White owned businesses, who would rather put up more collateral on their loans to demonstrate their creditworthiness and avoid explicit loan costs in the form of interest.The decomposition shows a similar situation between White owned businesses and Black owned businesses. Black owned businesses are only required to secure their loans with collateral 21% of the time, representing a 29 percentage point differential under White owned businesses.

Here the gap in collateral requirements is explained about 33% by the loan interest rate. The descriptives for male and female owned businesses show that male owned businesses are required to secure their loans 51% of the time, compared to female owned businesses which are required to do so only 42% of the time. The gap in collateral requirements between male and female owned businesses is explained about 15% by loan interest rates as well. The other mitigating factor in the decomposition is the amount of the loan, which stands to reason. The larger the loan amounts, the greater the likelihood that collateral will be required. As Table 1 illustrates, White and male owned businesses receive, on average, much larger loans than their minority and female owned business counterparts.

6. Conclusion

Collateral requirements can be used by lenders to mitigate problems associated with information asymmetries or by borrowers to help negotiate more favorable loan terms. This study demonstrates that White and male owned businesses, on average, provide collateral on their loans more often than minority and female owned businesses. They are also less risky relative to Hispanic, Black and female owned businesses based on their Dunn and Bradstreet credit score and the number of years their firms have been in business. The fact that they are deemed "less risky" and yet still contend with a greater incidence of collateral backed loans goes against the findings generated by Booth and Booth (2006), Berger and Udell (1995) and Jimenez, Salas, and Saurina (2006). The authors state that riskier borrowers tend to have collateral requirements imposed on their loans more often than less risky borrowers.

The decomposition results, however, indicate some relation to the findings Spence (1973), Chan and Kanatas (1985) and Leeth and Scott (1989) propose. Spence (1973) and Chan and Kanatas (1985) state that collateral can be offered by borrowers as a way to signal their creditworthiness to lenders. By showing their lower default probabilities, they anticipate lenders will be more willing to decrease their expected return on the loans. Leeth and Scott (1989) find that providing collateral reduces the interest rate and costs inherent in a loan. The less risky borrowers, in this case, White and male owned businesses, provide collateral requirements more often and also encounter lower loan costs. The average interest rate on White owned business loans is 6.37%, compared to 8.80% for Hispanic owned businesses and 9.95% for Black owned businesses. Male owned businesses average interest rates of 6.43% while female owned businesses average rates of 7.07%. In all three group comparisons, loan interest rates were the largest contributing factor to the gap in collateral requirements experienced between borrowers.

The primary limitations of this study include the fact that the results are obtained from a smaller subsample of borrowers that obtained loans over the course of the past three years. This was necessary because the subsample was the only part of the database that included all the variables required to perform the analysis. This resulted in a much smaller sample size that does not reflect the representation of minorities and females evidenced at the national level. This disproportionate underrepresentation could be due to borrowers opting to self-finance (through personal savings or through non-mainstream borrowing from family members) and not necessarily to lender hesitation to grant loans. The database also does not provide insight into whether collateral requirements are imposed by the lender, or if borrowers choose to provide collateral to signal their creditworthiness and obtain lower loan costs.

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Table 1. Description of firm, market, and loan characteristics by race/ethnicity and gender

		Race/Ethnicity			Gender	
Variables	All	White	Hispanic	Black	Male	Female
Collateral Required (dependent variable)						
Yes (%)	49.9	50.7	42.9	21.1	51.4	41.6
No (%)	50.1	49.3	57.1	78.9	48.6	58.4
Firm Characteristics						
Relationship length (months)	97.68	99.39	88.48	31.23	100.50	82.15
Geographic proximity to bank (miles)	54.29	54.77	37.73	63.92	51.37	70.34
Firm age (years)	15.52	15.79	11.78	9.83	16.04	12.67
D&B credit score	3.71	3.74	3.42	2.48	3.75	3.48
Market Characteristic						
Competition	2.41	2.43	2.08	2.19	2.40	2.47
Loan Characteristics						
Amount of loan (/1,000,000)	0.31	0.32	0.10	0.09	0.34	0.15
Loan interest rate (%)	6.53	6.37	8.80	9.95	6.43	7.07
Gender						
Male (%)	84.62	84.70	83.12	83.84	-	-
Female (%)	15.38	15.30	16.88	16.16	-	-
Number of observations	1645	1569	52	23	1435	207

Source: Estimates based on the Federal Reserve's Survey of Small Business Finances 2003

Table 2a. Decomposition of differences in collateral requirements by race/ethnicity and gender

	Decomposition Analysis					
	Race/Ethnicity				Gender	
	Hispanic		Black		Female	
	Factor	%	Factor	%	Factor	%
White collateral requirement	0.5073		0.5073			
Male collateral requirement	-				0.5137	
Specific group collateral requirement	0.4288		0.2111		0.4158	
Difference	0.0784		0.2961		0.0978	
Explained						
Firm Characteristics						
Relationship length (months)	-0.0006	-0.8	-0.0035	-1.2	-0.0015	-1.5
Geographic proximity to bank	-0.0004	-0.5	0.0002	0.1	0.0008	0.8
Firm age (years)	-0.0043	-5.5	-0.0063	-2.1	-0.0024	-2.5
D&B credit score	-0.0059	-7.5	-0.0230	-7.8	-0.0057	-5.8
Market Characteristic						
Competition	0.0211	26.9	0.0146	4.9	-0.0042	-4.3
Loan Characteristics						
Amount of loan (/1,000,000)	0.0057	7.3	0.0060	2.0	0.0054	5.5
Loan interest rate (%)	0.0660	84.2	0.0974	32.9	0.0153	15.6
Gender						
Female	0.0015	1.9	0.0008	0.3	-	-
Race/Ethnicity						
Hispanic	-	-	-	-	0.0000	0.0
Black	-	-	-	-	0.0003	0.3
All included explained variables	0.0831	106.0	0.0862	29.1	0.0080	8.1

Source: Estimates based on the 2003 Federal Reserve's Survey of Small Business Finances

Table 2b. Decomposition of differences in collateral requirements by race/ethnicity and gender

	Decomposition Analysis					
	Hispanic		Black		Female	
	Factor	%	Factor	%	Factor	%
Unexplained						
Firm Characteristics						
Relationship length (months)	-0.0607	-77.4	-0.0215	-7.3	0.0018	1.8
Geographic proximity to bank	-0.0189	-24.1	0.0909	30.7	-0.0020	-2.0
Firm age (years)	-0.1900	-242.3	0.1563	52.8	0.0033	3.4
D&B credit score	-0.6556	-836.2	-0.0002	-0.1	-0.0203	-20.8
Market Characteristic						
Competition	0.0823	105.0	0.2663	89.9	-0.0921	-94.2
Loan Characteristics						
Amount of loan (/1,000,000)	-0.0027	-3.4	-0.0021	-0.7	-0.0074	-7.6
Loan interest rate (%)	0.0467	59.6	0.6486	219.0	-0.0002	-0.2
Gender						
Female	0.0044	5.6	-0.0333	-11.2	-	-
Race/Ethnicity						
Hispanic	-	-	-	-	0.0032	3.3
Black	-	-	-	-	-0.0064	-6.5
Constant	0.7899	1007.5	-0.8950	-302.3	0.2099	214.6
All included unexplained variables	-0.0046	-5.9	0.2100	70.9	0.0898	91.8

Source: Estimates based on the 2003 Federal Reserve's Survey of Small Business Finances